

## A study on “Gender Disparity in Agricultural Resource Management in the state of Uttarakhand”

### Abstract

Agriculture is one of the drudgery-prone jobs in the unorganized sector, which employs the majority of women. Since agriculture provides them with bread and butter, many Uttarakhand hill people still make agriculture their primary source of income. Planting, transplanting, weeding, thinning, harvesting, winnowing, processing, selling, storing, taking care of animals, kitchen gardening, and other chores are just a few of the numerous jobs that women perform in the agricultural industry. The current study aims to evaluate the disparity between genders in the agriculture sector's resource access. The study was conducted in two districts of Uttarakhand, AER 9 (Udham Singh Nagar) and AER 14 (Almora). The study area and samples were chosen using a combination of random selection and the purposeful sampling technique. The data was collected between August 2023 and February 2024. There were 240 samples in all. Data was collected for the selected samples through survey method. Appropriate statistics such as frequency, percentage, etc. were used to analyse the data in Microsoft Excel. With 80.33–98.33% of respondents having minor agricultural implements, the bulk of respondents have over 15 years of farming experience. When it comes to labour and marketing, men rule, although women are more likely to help with weeding and produce sorting/storage. Very few households own large farm implements. Men handle land-related chores and chemicals, equipment, and fertilizers, whereas women are more likely to work on off-farm tasks like gathering firewood and fetching water. The findings demonstrated that men generally hold more powerful positions and have access to and control over significant farm resources, particularly when it comes to crucial decision-making areas like land transactions and the purchase of tools and implements. The percentages for female and joint control indicated regions that might be targeted for the promotion of equal access to and control over agricultural resources through gender-inclusive policies and actions.

**Keywords:** Drudgery, Agriculture, Resource access, Decision making, Gender inclusive

### INTRODUCTION

In the agrarian nation of India, rural men and women frequently make their living from agriculture. Among the drudgery-prone occupations in the unorganized sector, where most women work, is agriculture. The main source of income in Uttarakhand is agriculture, which is mostly practiced in hilly, rain-fed regions. Planting, transplanting, weeding, thinning, harvesting, winnowing, processing, selling, storing, taking care of animals, kitchen gardening, and other chores are just a few of the numerous jobs that women perform in the agricultural industry. Many people in Uttarakhand, particularly those who reside in the state's mountainous regions, work in agriculture, which is the main source of income for the state. Since agriculture provides them with bread and butter, many Uttarakhand hill people still make agriculture their primary source of income. As men migrate from the hills to the cities in search of better employment, women of Uttarakhand are still engaged in agriculture.

Lack of land holdings, identity as farmers, unequal resource distribution, and technology constraints are the main challenges faced by women in rural farming. In addition to having to deal with a lot of housework, rural women have access to antiquated tools designed only for men, which makes the arduous labour on the farm even more challenging and time-

consuming. Additionally, their incapacity to obtain contemporary technologies reduces their output at the farm (Joshi and Chaudhary, 2021).

The irony is further compounded by the fact that almost 40 percent of the population lacks any land ownership. This is especially important for women, whose land ownership rates vary from 1 to 34 percent in each state, with the national average being 13.5 percent (CIWA 2016).

Implementing new technologies to alter farming practices or making current tasks easier or more productive for the labor force already in place are the two approaches to reduce the workload (i.e., time and energy) that women carry in farming operations. Changing existing methods or utilizing new technologies can often lessen women's workloads, but doing so requires outside help, more expertise, and coaching (Aryal and Kattel, 2019).

It is commonly acknowledged that reducing gender disparity promotes agricultural growth and the achievement of food and nutritional security on a global scale. About one-third of the labor force is made up of women, who make up roughly half of the world's population. The status of women in the household and their rights to equality with men in other spheres of social life are no longer the only issues pertaining to women today.

Even though there are more women employed in the industry, they face certain challenges that lower their output (Joshi and Chaudhary, 2021).

Akter et al. (2017) revealed trends that contradict the conventional narratives of gender inequity in agriculture in certain domains of empowerment. In Myanmar, Thailand, Indonesia, and the Philippines, women seem to have more influence over household income and equal access to productive resources like land and inputs. In terms of empowerment at the community level, significant intra-regional variation is noted. In Thailand and the Philippines, women actively participate in agricultural groups, while in Indonesia and Myanmar, this is primarily a male domain. These results suggest that in order to close the gender gap in agriculture, gender intervention strategies tailored to each nation are required.

Jayakumar and Surudhi (2015) carried out to ascertain the representation of women and their academic achievement in agricultural education. The results of the survey showed that women were nearly equally represented in agricultural courses and received higher-quality education, including private schooling and English-medium instruction. Women were more likely than men to enrol in agricultural courses, according to recent patterns during the previous four years. Additionally, the increase rate for female students was higher. Additionally, women's academic accomplishment percentages were noticeably greater than men's. These encouraging signs have a good impact on the future growth of the agriculture industry and send strong enough signals for women to be treated equally in agricultural courses.

Jayachandran (2014) showed that gender gaps in several domains are large in developing countries and laid out several mechanisms through which, as countries grow, women's lot should improve. First, there is a sectoral change from agriculture to services. Second, the time required for domestic duties is decreased by technological advancements. Third, there is a decrease in the likelihood and frequency of childbearing. Every one of these elements raises women's labor force involvement, which raises investments in human capital for girls and women's individual freedom. He discussed cultural customs including patrilocality and male-centered burial rites that may contribute to gender inequity in today's developing nations despite economic progress. The unusually low rate of female labor force involvement in North Africa, the Middle East, and India is probably due to the importance these cultures

place on women's "purity." Gender disparities may eventually close as a result of the natural decline of male-oriented cultural institutions brought about by economic modernity, but politicians may also be able to hasten this process.

In the chosen study regions, gender disparity arises from factors such as land ownership and decision-making, household economics, and involvement in communal affairs. More research should be done on the disparity between the qualitative and quantitative results, particularly with regard to the income contribution of women in the home. Men and women may have taken unilateral rather than cooperative actions to combat harsh weather conditions as a result of their ignorance of climate change and variability. Individual actions like taking out loans and enlisting the assistance of extended family members might strain relationships within the family and lead to future injustices (Xenarioset al, 2016).

Despite the fact that agricultural research has advanced sufficiently, there is no coordination between the research labs and farms in the various agroclimatic zones of the nation. As a result, ordinary cultivators—particularly marginal and small farmers—do not benefit from new agricultural research. Education and training farmers to adopt new agricultural ideas and approaches to boost agricultural production is receiving very little attention (Selvanet al., 2023).

## **METHODOLOGY**

The aim of present study is to evaluate the disparity between genders in the agriculture sector's resource access in Uttarakhand. The methods and procedures developed for conducting the study are presented as follow:

### **Universe of the Study**

The current study was carried out in the state of Uttarakhand. The state of Uttarakhand is divided into 13 districts and two divisions, Kumaon and Garhwal and the districts namely, Uttarkashi, Deharadun, Rudraprayag, Pithoragarh, Pauri, Tehri, Champawat, Haridwar, Chamoli, Almora, Bageshwar, Nainital, and Udham Singh Nagar.

### **Locale of the Study**

Mid hill and Tarai region of Kumaun division in Uttarakhand were selected for the study purposively.

### **Sampling Procedure**

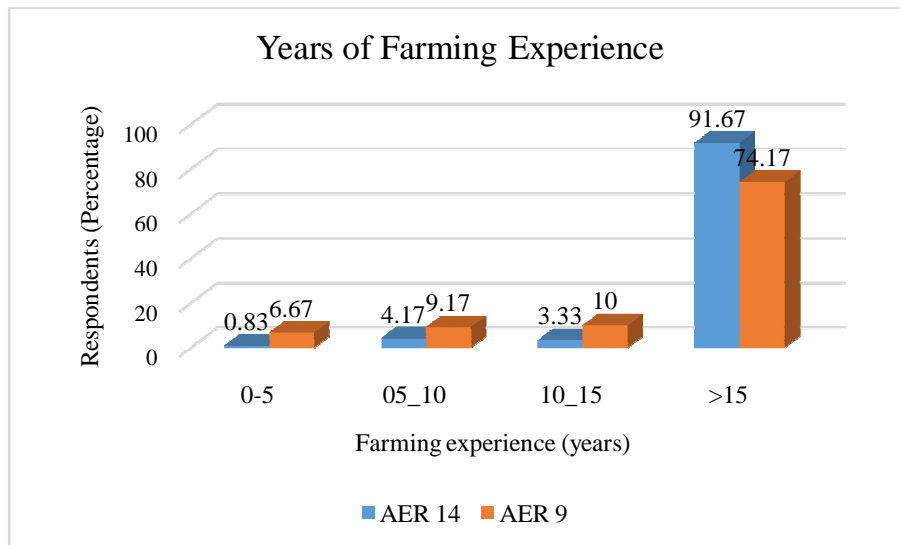
A combination of purposeful and random sampling techniques were used to choose the study region and samples. The Almora and Udham Singh Nagar were chosen purposively for the current study. Further, Rudrapur and Gadarpur blocks were chosen randomly from Udham Singh Nagar district, while Takula and Dwarahat blocks were chosen randomly from Almora district. From each block two villages were chosen at random. Thus, the study sample consisted of eight villages and out of each village thirty farm women were selected. Hence a total of 240 farm women were selected as the respondents for the current study.

### **Data Collection Tools and Techniques**

Descriptive data was collected for the selected samples through survey method. The data was collected between August 2023 and February 2024. Appropriate statistics such as frequency, percentage, etc. were used to analyse the data in Microsoft Excel.

## RESULTS AND DISCUSSION

### Years of Farming of Respondents



**Fig 1: Years of farming experience**

Figure 1 depicts the distribution of farming experience among individuals across different regions, showcasing their proficiency in various aspect. Each row represents a range of years of farming experience, categorized into 0-5 years, 5-10 years, 10-15 years, and above 15 years. The columns correspond to different regions, namely AER 14 and AER 9.

The values within the table represent the percentage of experience in farming for each respective region and experience range. For instance, in the last row (>15 years of experience), individuals from AER 14 exhibit a proficiency of 91.67%, while those from AER 9 have an experience of 74.17%. Similarly, the percentages indicate the proficiency level for each region and experience range combination. The data shows that majority of the respondents were having experience of more than 15 years in farming.

Chunera (2019) revealed that the bulk of the female farmers were middle-aged (52 percent), had just a primary education (34%), and were in the lower income bracket (36%). Half of the women farmers earned through secondary occupation.

### Gender participation

**Table 1: Gender participation in different activities (N= 240)**

Sr. No.	Gender participation in different activities	Male (%)		Female(%)		Both(%)	
		AER 14	AER 9	AER 14	AER 9	AER 14	AER 9
<b>1</b>	<b>Agriculture</b>						
	Field preparation	11.67	21.67	25.00	20.00	63.33	58.33
	Sowing/ planting	20.00	11.67	30.83	30.83	49.17	57.50
	Weeding	11.67	10.00	56.67	40.00	31.67	50.00
	Application of manure & fertilizer	11.67	22.50	25.00	25.83	63.33	51.67
	Harvesting	12.50	15.83	24.17	26.67	63.33	57.50

	Sorting and storage of produce	13.33	12.50	30.00	27.50	56.67	60.00
	Marketing	20.83	57.50	15.83	23.33	63.33	19.17
	Engagement of labour	26.67	86.67	40.00	9.17	33.33	4.17
	Management of cash	10.83	20.83	21.67	18.33	67.50	60.83
<b>2</b>	<b>Off farm</b>						
	Collection of firewood/fodder and water	0.83	5.00	71.67	30.00	15.00	43.33
	Carrying water	2.50	-	55.00	-	42.50	-
	Cutting and gathering	2.50	5.00	71.67	30.00	25.00	43.33
	Collection and bringing back to home and storage	0.83	5.00	55.83	30.00	43.33	43.33
<b>3</b>	<b>Livestock management</b>						
	Cattle grazing	16.67	17.5	48.33	38.33	32.5	22.5
	Shed management and rearing	25.00	5.00	37.50	41.67	35.00	31.66
	Milking	5.00	18.33	42.50	21.67	50.00	38.33
	Marketing of produce	13.33	55.00	36.67	6.67	47.50	16.67
	Vaccination	13.33	23.33	25.83	5.83	45.83	49.16
	Others (preparing dung cakes etc.)	5.83	44.17	21.67	5.83	54.17	28.33
<b>4</b>	<b>Kitchen gardening</b>						
	Fencing	3.33	2.50	26.67	22.5	70.00	75.00
	Vegetable Production	0.83	8.33	29.17	26.67	70.00	65.00
	Sowing	0.83	0.83	27.50	28.33	71.67	70.83
	Harvesting	0.83	10.83	35.83	28.33	63.33	60.83
	Marketing	5.83	84.17	20.00	5.83	74.17	10.00
<b>5</b>	<b>Homestead</b>						
	Payment of electricity bill/bank	55.00	65.83	26.67	19.17	18.33	15.00
	Cooking	3.33	1.67	80.00	85.83	16.67	12.50
	Child care	0.83	0.83	70.83	77.50	28.33	21.67
	Washing & Cleaning	5.83	2.50	79.17	86.67	15.00	10.83

The table 1 outlines the participation of male, female, and both genders in various activities across different sectors. The activities are categorized into specific areas such as agriculture, off-farm tasks, livestock management, kitchen gardening, homestead chores, and fishing.

Agriculture tasks were related to field preparation, sowing/planting, weeding, application of manure & fertilizer, harvesting, sorting/storage of produce, marketing, engagement of labor, and cash management whereas off farm includes tasks like collecting firewood/fodder, water, and carrying water. Livestock Management involves cattle grazing, shed management, milking, marketing of livestock produce, vaccination, and other related activities. Kitchen Gardening includes activities such as fencing, vegetable production, sowing, harvesting, and marketing.

Qureshi et al., (2021) highlighted that although there is little correlation between improved agricultural performance and better nutrition, the agriculture sector can still improve nutrition in a number of ways, including raising the incomes of women farmers' households,

diversifying crop production, empowering women, boosting agricultural productivity and diversity, and carefully crafting price and subsidy policies that can promote the production and consumption of nutrient-rich crops. Diversifying agricultural livelihoods through agri-allied industries like forestry, fisheries, and animal husbandry has improved livelihood opportunities, bolstered resilience, and resulted in a significant rise in labor force participation, all of which can contribute to India's economic development.

Homestead tasks like paying bills, cooking, child care, and cleaning were also included in assessing gender participation.

Participation of male in agriculture activities like engagement of labour and marketing (26.67% & 20.83% for AER14 and 86.87% & 57.5% AER9 respectively) was dominating while females in AER 9 had higher participation in activities like weeding, sowing and sorting/storage of produce. Females in AER 14 had higher participation in activities like weeding, engagement of labour and sowing. Off-farm activities in AER 14 showed a significant female involvement in tasks like collecting firewood/fodder, carrying water, cutting and gathering and collection and bringing back to home and storage while in AER 9 off farm activities showed shared participation. Livestock management involves shared responsibilities, with males predominantly engaged in activities like marketing of livestock produce in AER 9 and shed management and rearing in AER 14 and females contributing significantly to cattle grazing and milking in AER 14 and cattle grazing and shed management and rearing in AER 9.

Kitchen gardening tasks demonstrate a shared participation between genders. Homestead chores like cooking (80 % in AER 14 & 85.83 % in AER 9), child care (70.83% in AER 14 & 77.5% in AER 9) and washing and cleaning (79.17 % in AER 14 & 86.67% in AER 9) show predominantly female participation in both the regions.

Vishwakarma (2018) revealed that in Uttarakhand, more women participated in the workforce. The increase in women's employment rates essentially stayed the same. During the study period, the quantity and composition of the female labor force were not very excellent.

## Possession of Farm implements

**Table 2: Farm implements of selected respondents of Uttarakhand of AER14 and 9 (N=240)**

Sr. No.	Farm implements	Own (%)		Hired on rent (%)	
		AER 14	AER 9	AER 14	AER 9
1	Sickle	95.00	98.33	1.67	1.67
2	Shovel	97.50	93.33	1.67	1.67
3	Pick axe	87.50	80.83	10.83	10.83
4	Posting digger	7.50	5.83	91.67	91.67
5	Agricultural hoes	4.17	9.16	95.83	90.83
6	Chaff-cutter	-	78.33	-	-
7	Agricultural plough	-	12.50	-	87.50
8	Harrow	0.83	15.83	34.17	70.83
9	Sprayer	9.17	28.33	89.17	71.66
10	Water pump	4.17	64.17	-	35.83

11	Land leveller	3.33	8.33	95.83	91.67
12	Thresher	1.67	6.67	96.67	93.33
13	Tiller	0.83	2.50	9.17	68.33
14	Tractor	-	15.83	-	84.17
15	Seed cum fertilizer	1.67	4.17	98.33	95.83
16	Combine harvester	0.83	4.17	6.67	86.67

Table 2 presents data on the ownership and rental usage of various farm implements. It can be observed from table that small farm implements like sickle, shovel, and axe were owned by majority of the respondents 80.33 to 98.33 percent whereas large farm implements (Agricultural plough, harrow, land leveller, thresher, tiller, tractor, seed cum fertilizer, combine harvester) were possessed by few (0.83-15.83%) of the respondents and were used on hiring basis by rest of the households in both the agro ecological regions. Chunera (2019) found that in the hilly area of Uttarakhand, the majority of farm women owned small amounts of land, were involved in one group or organization (46.67%), and fell into the medium categories of owning agricultural equipment (82%), and animals (46%).

### Access and control over resources

**Table 3: Access and control of gender over farm related resources (N= 240)**

Sr. No.	Sub activities	Male (%)		Female (%)		Both (%)	
		AER 14	AER 9	AER 14	AER 9	AER 14	AER 9
1	Use of land	60.83	80.00	9.17	5.00	30.00	15.00
2	Purchase of land	88.33	90.00	5.83	5.83	5.83	4.17
3	Sale of land	65.00	95.00	10.83	1.67	24.17	3.33
4	Tools and implements	56.67	78.33	10.83	10.00	32.50	11.67
5	Improved seed	60.00	65.00	12.50	15.00	27.50	20.00

6	Fertilizers	61.67	55.83	13.33	11.67	25.00	32.50
7	Insecticides/pesticides	60.00	65.00	8.33	10.00	31.67	25.00
8	Retention for household purpose	65.00	53.33	16.67	21.66	18.33	25.00
9	Retention for commercial purpose	55.83	65.83	16.67	11.67	27.50	22.50
10	Management of cash	50.00	55.83	19.17	15.00	30.83	29.17
11	Credit	60.00	64.17	20.00	14.17	20.00	21.67

This data in Table 3 highlights gender disparities in access and control over critical farm-related resources, with males generally holding more dominant positions, particularly in key decision-making areas related to land transactions and tools/implements. The percentages for female and joint control suggest areas where efforts for gender-inclusive policies and interventions could be focused on promoting equitable access and control over agricultural resources. Males predominantly control land-related activities like use, purchase, and sale in both the AER.

Tools, fertilizers, improved seed and chemicals are also more within male control with significant involvement from females and joint control.

Retention for household and commercial purposes was indicating male decision-making or control over resources for domestic use in both the AER.

Baliyan (2018) revealed that in Uttar Pradesh, India, the male family members—typically the head of the household—are solely responsible for all market-related tasks, such as purchasing agricultural supplies, employing labor, and selling the finished product. Only women perform the tasks of weeding, cleaning, and storing grain. Men typically perform tasks including plowing, irrigation, fertilizer and pesticide spraying, and land preparation. Men and women work together to perform other agricultural tasks like gathering seeds, sprinkling manure, planting, moving, harvesting, threshing, and transporting the grains home.

Chunera(2019) highlighted that the most significant areas of climate change information need among male farmers were identified as following: current agricultural practices, crop and livestock production, human health, crop management strategies, animal disease control, credit sources, organic farming, feeding management, disaster prevention measures or extreme weather, and early warning of disasters.

## CONCLUSION

Agriculture, is a drudgery-prone sector and is predominantly occupied by women, particularly in Uttarakhand, a region with hilly areas. They perform various tasks such as planting, transplanting, weeding, harvesting, and processing. Women contribute to agricultural growth and food security, making up nearly half of the global population and one-third of the labour force. Addressing gender inequality is crucial for women's rights and equality in various aspects of life. The current study aimed to evaluate the disparity between genders in access to agricultural resource in Almora and U.S. Nagar district of Uttarakhand state. The data indicated that most respondents have over 15 years of farming experience, with males dominating labour and marketing activities, while females in AER 9 and AER 14 have higher participation in weeding, sowing, and sorting. In AER 14, females significantly participated in off-farm tasks like collecting firewood and water, while in AER 9, they shared livestock

management responsibilities. Kitchen gardening tasks were also shared between genders. Homestead chores like cooking, child care, and washing were predominantly female in both regions. The majority of respondents own small farm implements like sickle, shovel, and axe, while few own large ones and use them on a hiring basis in both agro ecological regions. The data reveals gender disparities in farm-related resources, with males holding more dominant positions in key decision-making areas. Males control over land-related activities, tools, fertilizers, seed, and chemicals. . Female and joint control suggests gender-inclusive policies could promote equitable access and control over agricultural resources.

#### Disclaimer (Artificial intelligence)

##### Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

##### Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

- 1.
- 2.
- 3.

#### REFERENCES

- **Akter S., Rutsaert P., Luis J., Htwe N.M., San S.S., Raharjo B., Pustaka A. (2017).** Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy*, 69:270-279.
- **Aryal, U. and Kattel, R.R. (2019).** Drudgery reduction for women in agriculture sector in Nepal: An analytical study. *Agriculture and Environmental Science*, 4(4): 449-463, <https://dx.doi.org/10.26832/24566632.2019.0404012>
- **Baliyan K. (2018).** Use of Female Family and Hired Labour in Agriculture: An Empirical Study in Western Uttar Pradesh, India. *Gender and Women's Studies*. 2018, 2(1):2.
- **Chunera A. (2019).** Gender vulnerability due to climate change: A study in hilly region of Uttarakhand. G.B. Pant University of Agriculture and Technology, Pantnagar - 263145 (Uttarakhand)
- **ICAR-Central Institute for Women in Agriculture (CIWA) (2016)** Annual Report 2015–16. Bhubaneswar, India, p.10. Kelkar, G.
- **Jayakumar N., and Surudhi M. (2015).** Gender Equality in Agricultural Education. *Journal of Extension Education*, 27(1):5388-5393.

- **Jayachandran S. (2014).** THE ROOTS OF GENDER INEQUALITY IN DEVELOPING COUNTRIES. NBER WORKING PAPER No. 20380, NATIONAL BUREAU OF ECONOMIC RESEARCH.
- **Joshi C.S .andChaudhary T.(2021).** Women Participation in agriculture sector in hilly regions of Uttarakhand. *Indian Journal of Hill Farming*.34(1): 109-114.
- **Qureshi S., Ahmed A., Nargis S. (2021).**WOMEN PARTICIPATION IN HILLY AREAS OF UTTARAKHAND INDIA AN ANALYTICAL STUDY.*European Scholar Journal (ESJ)* , 2(5):1-5. DOI:10.17605/OSF.IO/RQFA3
- **Selvan T., Panmei L., Murasing K.K., Guleria V.(2023).**Circular economy in agriculture: unleashing the potential of integrated organic farming for food security and sustainable development. *Frontiers sustainable food system*.7.https://doi.org/10.3389/fsufs.2023.1170380.
- **Vishwakarma N. (2018).**Women's Participation in Agricultural Employment with Special Reference to Uttar Pradesh and Uttarakhand in India. *Economic Affairs*, 63(2):371-374.
- **Xenarios S. , Nemes A. , Sarker G. W., Sekhar N.U. (2016).**Assessing vulnerability to climate change: Are communities in flood-prone areas in Bangladesh more vulnerable than those in drought-prone areas?*Water resources and rural development* 7:1–19.

UNDER PEER REVIEW